

# Type Testing of Terminal Range

## To BS EN 16475-7:2016

Carried out for  
IQ Design

Report 100404/1

Compiled by Dave Butler

2 April 2020



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# Type Testing of Terminal Range

## To BS EN 16475-7:2016

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# 1 INTRODUCTION

A range of Cowls manufactured by IQ design were submitted to BSRIA Ltd. on 21 January 2020 for type testing to the specific requirements of BS EN 16475-7:2016.

The tests were carried out between the 29 January 2020 and 24 February 2020.

The report refers only to the range of cowls referred to in this report.

# 2 DESCRIPTION OF SAMPLES

The test samples were received in good condition.

**Table 1 Test items**

Date of Receipt	Test Engineer Initials	Full Description of Test Items	Reference Number
29/01/20	DB	1 off 200 mm flue diameter Smart Cap stainless steel cowl	100404A1DB
29/01/20	DB	1 off 200 mm flue diameter Smart Storm stainless steel cowl	100404A2DB
29/01/20	DB	1 off 200 mm flue diameter Smart H stainless steel cowl	100404A3DB
29/01/20	DB	1 off 200 mm flue diameter Smart Capping stainless steel cowl	100404A4DB
29/01/20	DB	1 off 200 mm flue diameter Push-Fit Smart Cap stainless steel cowl	100404A5DB
29/01/20	DB	1 off 200 mm flue diameter Push-Fit Smart Cap black finish cowl	100404A6DB
29/01/20	DB	1 off 200 mm flue diameter Push-Fit Storm stainless steel cowl	100404A7DB
29/01/20	DB	1 off 200 mm flue diameter Push-Fit Storm terracotta finish cowl	100404A8DB
29/01/20	DB	1 off 200 mm flue diameter Push-Fit Smart H stainless steel cowl	100404A9DB
29/01/20	DB	1 off 200 mm flue diameter Push-Fit Capping stainless steel cowl	100404A10DB
29/01/20	DB	1 off 200 mm flue diameter Push-Fit Capping black finish cowl	100404A11DB
29/01/20	DB	Set of specifications for Smart range of products	100404A12DB
29/01/20	DB	Set of specification for Push-Fit range of products	100404A13DB
21/02/20	DB	1 off 200 mm flue diameter Smart Storm stainless steel cowl	100404A14DB
21/02/20	DB	1 off 200 mm flue diameter Smart Storm terracotta finish cowl	100404A15DB

### 3 INSTRUMENTATION

**Table 2 Instrument list**

Instrument description	BSRIA Number	Calibration expiry date
1 m steel rule	286	24/04/20
80 mm external dial callipers	1594	14/01/21
Electronic Vernier	888	14/01/21
Vertical test chimney	301	Test aid
Hot gas generator & burner	1820	Test aid
Computer system	1806	Test aid
FGT probe	1771	03/06/20
Testo 922	1765	03/06/20
Hot wire anemometer	1291	06/06/20
Testo logger	1141	05/04/20
Digital stopwatch	2956	03/02/21
Digital stopwatch	2957	01/03/20
Testo 330 CO/CO <sub>2</sub> analyser	1766	15/03/20
KIMO S tube	1647	12/01/21
Rain ingress test assembly	302	Not used
Mag flow unit	-	Not used
Digital scales	149	20/02/21
Flow resistance test assembly	303	Not used
Stack temperature probe	1773	12/06/20
Testo 922	7006	12/06/20

Note:- All tests were carried out within the calibration expiry dates.

## 4 TEST RESULTS

**Table 3 Findings of examination to relevant clauses from BS EN 1856-1:2009**

BS EN 16475-7:2016 Clause	Description of test	Complies?	
-	Test items	Yes	
-	Classification	Yes	(4.1)
4.1	Product characteristics	Yes	(4.2)
6.2.2	Manufacturer's declaration for type test	Yes	(4.3)
4.2	Dimensions & tolerances	No	(4.4)
4.3.1	Compressive strength	Yes (Note 1)	(4.5)
4.3.2	Wind load	Yes	(4.6)
4.3.3	Resistance to freeze thaw	Yes	(4.7)
4.4.1	Reaction to fire	N/A	-
4.4.2.1	Fire resistance - Heat stress	Yes	(4.7)
4.4.2.2	Fire resistance - Resistance to sootfire	Yes	(4.8)
4.5.1	Corrosion resistance	Yes	(4.9)
4.5.2	Dangerous substances	N/A	-
5.3.1	Rain ingress	Yes	(4.10)
5.3.2	Flow resistance of the rain cap	Yes	(4.11)
7	Product information	Yes	(4.12)
8	Designation	Yes	(4.13)
9	Marking & labelling	Yes	(4.14)

Note 1:- The smartstorm stainless steel cowl, test item 100404A2DB collapsed under compressive load of 11.1 Kg loading, the area reduced to 65.7% free area. We also tested the push-fit terracotta storm cowl test item 100404A8DB, which also collapsed under 11.45 Kg loading, the area reduced to 85.5% free area. It was noted that the support wall thickness was 0.53 and 0.64 respectively.

BSRIA requested further samples, test items 100404A14DB and 100404A15DB with stronger supports, i.e. correct material thickness, declared as  $0.9 \pm 0.055$  mm.

#### 4.1 CLASSIFICATION

The tables below identifies whether testing is required on particular samples. "Ref." indicates that two products are similar in construction and that only one test is required to cover several products.

**Table 4 Classification**

No.	Product name	Material	Characteristics	Dimensions & tolerances	Compressive strength	Wind load	Heat stress	Resistance to sootfire	Corrosion resistance	Rain ingress	Flow resistance
1	Smart Cap (100404A1DB)	S/S 316	Yes	Yes	Yes	Yes	Yes	Yes	Material	Note 1	Yes
2	Smart Cap	S/S Black Finish	Ref. 1	Ref. 1	Ref. 1	Ref. 1	Ref. 1	Ref. 1	Material	Ref. 1	Ref. 1
3	Smart Cap	S/S Terracotta Finish	Ref.1	Ref.1	Ref.1	Ref.1	Ref.1	Ref.1	Material	Ref.1	Ref.1
4	Smart Storm Cowl (100404A2DB, replaced by 100404A14DB)	S/S 316	Yes	Yes	Yes	Yes	Yes	Yes	Material	Note 2	Yes
5	Smart Storm Cowl	S/S Black Finish	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Material	Ref. 4	Ref. 4
6	Smart Storm Cowl (100404A15DB)	S/S Terracotta Finish	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Material	Ref. 4	Ref. 4
7	Smart H Cowl (100404A3DB)	S/S 316	Yes	Yes	Ref. 1	Ref. 1	Ref. 4	Ref. 4	Material	Note 2	Yes
8	Smart H Cowl	S/S Black Finish	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Material	Ref. 7	Ref. 7
9	Smart H Cowl	S/S Terracotta Finish	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Material	Ref. 7	Ref. 7
10	Smart OH Cowl	S/S 316	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Material	Ref. 7	Ref. 7
11	Smart OH Cowl	S/S Black Finish	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Material	Ref. 7	Ref. 7
12	Smart OH Cowl	S/S Terracotta Finish	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Material	Ref. 7	Ref. 7
13	Smart Capping Cowl (100404A4DB)	S/S 316	Yes	N/A	Ref. 1	Ref. 1	N/A	N/A	Material	N/A	N/A
14	Smart Capping Cowl	S/S Black Finish	Ref. 13	Ref. 13	Ref. 13	Ref. 13	N/A	N/A	Material	N/A	N/A
15	Smart Capping Cowl	S/S Terracotta Finish	Ref. 13	Ref. 13	Ref. 13	Ref. 13	N/A	N/A	Material	N/A	N/A



**Table 5 Classification**

No.	Product name	Material	Characteristics	Dimensions & tolerances	Compressive strength	Wind load	Heat stress	Resistance to sootfire	Corrosion resistance	Rain ingress	Flow resistance
16	PushFit Smart Cap (100404A5)	S/S 316	Yes	Ref. 1	Ref. 1	Ref. 1	Ref. 17	Ref. 17	Material	Note 1	Ref. 1
17	PushFit Smart Cap (100404A6DB)	S/S Black Finish	Yes	Yes	Ref. 16	Ref. 16	Ref. 1	Ref. 1	Material	Ref. 16	Ref. 1
18	PushFit Smart Cap	S/S Terracotta Finish	Ref. 16	Ref. 16	Ref. 16	Ref. 16	Ref. 1	Ref. 1	Material	Ref. 16	Ref. 4
19	PushFit Smart Storm Cowl (100404A8DB)	S/S 316	Yes	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Material	Note 2	Ref. 4
20	PushFit Smart Storm Cowl	S/S Black Finish	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Material	Ref. 19	Ref. 4
21	PushFit Smart Storm Cowl (100404A9DB)	S/S Terracotta Finish	Yes	Yes	Ref. 4	Ref. 4	Ref. 4	Ref. 4	Material	Ref. 19	Ref. 4
22	PushFit Smart H Cowl (100404A7DB)	S/S 316	Yes	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Ref. 7	Material	Note 2	Ref. 7
23	PushFit Smart H Cowl	S/s Black Finish	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Material	Ref. 22	Ref. 7
24	PushFit Smart H Cowl	S/S Terracotta Finish	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Material	Ref. 22	Ref. 7
25	PushFit Smart OH Cowl	S/S 316	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Material	Ref. 22	Ref. 7
26	PushFit Smart OH Cowl	S/S Black Finish	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Material	Ref. 22	Ref. 7
27	PushFit Smart OH Cowl	S/S Terracotta Finish	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Ref. 22	Material	Ref. 22	Ref. 7
28	PushFit Smart Capping Cowl (100404A10DB)	S/S 316	Yes	Ref. 13	Ref. 13	Ref. 13	N/A	N/A	Material	N/A	N/A
29	PushFit Smart Capping Cowl (100404A11DB)	S/S Black Finish	Yes	Ref. 13	Ref. 13	Ref. 13	N/A	N/A	Material	N/A	N/A
30	PushFit Smart Capping Cowl	S/S Terracotta Finish	Ref. 13	Ref. 13	Ref. 13	Ref. 13	N/A	N/A	Material	N/A	N/A

Note 1 :- Equal or greater than 27% from vertical, complies with requirement.

Note 2 :- Design such that flue is fully protected from water ingress.

## 4.2 PRODUCT CHARACTERISTICS

**Table 6 Product characteristics**

Material specification	Item No.					
	100404A1DB	100404A2DB	100404A3DB	100404A4DB	100404A5DB	100404A6DB
Rain cap material	Stainless steel 316	Stainless steel 316	Stainless steel 316	Stainless steel 316	Stainless steel 316	Stainless steel with Black finish
Type of cap	Pyramid	Pyramid	Pyramid	Pyramid	Pyramid	Pyramid
Material number	1.4404	1.4404	1.4404	1.4404	1.4404	1.4404
Thickness of cap (mm)	0.74	0.8	0.61	0.67	0.62	0.75
Number of supports	4	3	N/A	4	3	3
Wall thickness of supports (mm)	1.09	0.95	0.61	1.42	0.62	0.7
Mesh thickness	1.47	N/A	N/A	N/A	1.53	1.68
Method of fixing	ww	Ww	ww	ww	ww	ww
Relation between dome/pyramid & height/size	17.24 %	45.87 %	65.78	N/A	38.2 %	36.0 %
Size range (mm)	200	200	200	200	200	200
Weight (Kg)	0.950	1.540	3.182	0.688	1.698	1.730

**Table 7 Product characteristics**

Material specification	Item No.						
	100404A7DB	100404A8DB	100404A9DB	100404A10DB	100404A11DB	100404A14DB	100404A15DB
Rain cap material	Stainless steel 316	Stainless steel with Terracotta finish	Stainless steel 316	Stainless steel 316	Stainless steel with Black finish	Stainless steel 316	Stainless steel with Terracotta finish
Type of cap	Pyramid	Pyramid	Pyramid	Pyramid	Pyramid	Pyramid	Pyramid
Material number	1.4404	1.4404	1.4404	1.4404	1.4404	1.4404	1.4404
Thickness of cap (mm)	0.63	0.60	0.66	0.65	0.80	0.60	0.88
Number of supports	3	N/A	3	3	3	3	3
Wall thickness of supports (mm)	0.67	N/A	0.93	N/A	N/A	1.23	1.62
Mesh thickness	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Method of fixing	ww	Ww	ww	ww	ww	ww	ww
Relation between dome/pyramid & height/size	42.8 %	58.82 %	42.34 %	N/A	N/A	42.6 %	42.6 %
Size range (mm)	200	200	200	200	200	200	200
Weight (Kg)	2.110	3.692	2.110	1.528	1.564	1.540	1.783

### 4.3 MANUFACTURER'S DECLARATION FOR TYPE TEST

The manufacturer provided the relevant information required in clauses 6.2.2 and 7 of BS EN 16475-7:2016. The information is detailed in Section 4.1 and Section 4.2 of this report.

### 4.4 DIMENSIONS & TOLERANCES

Requirement - The thickness of material of the individual components of the rain cap (terminal) shall not be less than that declared by the manufacturer.

100404A1DB	Component part	Declared	Measured	Complies
	Cap	0.5	0.74	Yes
	Support	0.9±0.055	0.79	No
	Mesh	Note 1	-	-
	Base	0.5	1.47	Yes
100404A2DB	Component part	Declared	Measured	Complies
	Cap	0.5	0.73	Yes
	Support	0.9±0.055	0.42	No
	Mesh	Note 1	0.64	Yes
	Base	0.5	-	-
100404A3DB	Component part	Declared	Measured	Complies
	Cap	0.5	0.61	Yes
	Support	N/A	-	-
	Mesh	N/A	-	-
	Base	N/A	-	-
100404A6DB	Component part	Declared	Measured	Complies
	Cap	0.5	0.75	Yes
	Support	0.9±0.055	0.75	No
	Mesh	1.00	1.74	Yes
	Base	0.5	1.23	Yes
100404A14DB	Component part	Declared	Measured	Complies
	Cap	0.5	0.60	Yes
	Support	0.9±0.055	1.23	Yes
	Mesh	N/A	-	-
	Base	0.5	0.60	Yes
100404A15DB	Component part	Declared	Measured	Complies
	Cap	0.5	0.88	Yes
	Support	0.9±0.055	1.62	Yes
	Mesh	N/A	-	-
	Base	0.5	0.58	Yes

Note 1:- Manufacturer has not declared the material thickness.

#### 4.5 COMPRESSIVE STRENGTH

Requirement is that the rain cap shall not show a reduction of the original area of the rain cap by more than 10 % after the test.

100404A1DB	Free area before test	0.138	m <sup>2</sup>
	Force applied	0.26	kN
	Free area after test	0.138	m <sup>2</sup>
	Change in free area	0	%
100404A2DB	Free area before test	0.068	m <sup>2</sup>
	Force applied	0.108	kN
	Free area after test	0.045	m <sup>2</sup>
	Change in free area	34.3	%
100404A8DB	Free area before test	0.069	m <sup>2</sup>
	Force applied	0.108	kN
	Free area after test	0.060	m <sup>2</sup>
	Change in free area	13.1	%
100404A15DB	Free area before test	0.0637	m <sup>2</sup>
	Force applied	0.1082	kN
	Free area after test	0.0637	m <sup>2</sup>
	Change in free area	0	%

#### 4.6 WIND LOAD

Requirement is that the rain cap shall not show a reduction of the original area of the rain cap by more than 10 % after the test

Test items 100404A2DB and 100404A9DB were compromised during compressive strength test, therefore horizontal traction test was not carried out. BSRIA requested further samples, test items 100404A14DB and 100404A15DB with stronger supports, i.e. correct material thickness, declared as 0.9±0.055 mm.

#### Horizontal traction

100404A1DB	Free area before test	0.0889	m <sup>2</sup>
	Force applied	0.0562	kN
	Free area after test	0.0889	m <sup>2</sup>
100404A15DB	Change in free area	0	%
	Free area before test	0.057	m <sup>2</sup>
	Force applied	0.0304	kN
	Free area after test	0.057	m <sup>2</sup>
	Change in free area	0	%

### Vertical traction

100404A1DB	Free area before test	0.089	m <sup>2</sup>
	Force applied	0.0673	kN
	Free area after test	0.089	m <sup>2</sup>
	Change in free area	0	%
100404A15DB	Free area before test	0.057	m <sup>2</sup>
	Force applied	0.0304	kN
	Free area after test	0.057	m <sup>2</sup>
	Change in free area	0	%

### 4.7 RESISTANCE TO FREEZE-THAW

Metal products are considered deemed to satisfy freeze/thaw resistance.

### 4.8 FIRE RESISTANCE – HEAT STRESS & RESISTANCE TO SOOTFIRE

Requirement - The rain cap shall not show a reduction of the original area of the rain cap by more than 10 % after the test.

#### Test item 100404A1DB

#### Test requirement

Temperature designation - T600

Sootfire resistance - G

#### Test conditions for heat stress test

Flue diameter was 200 mm.

Flue gas temperature was 703 deg. C at 60 minutes.

Effective diameter	238	mm
Circumference	747.7	mm
Initial height of free area	130	mm
Initial measured free area	0.097	m <sup>2</sup>
Final height of free area	130	mm
Final measured free area	0.097	m <sup>2</sup>
Percentage reduction in free area	0	%

#### Test conditions for sootfire resistance test

Flue diameter was 200 mm.

Flue gas temperature 1000 deg. C

Effective diameter	238	mm
Circumference	748	mm
Initial height of free area	130	mm
Initial measured free area	0.097	m <sup>2</sup>

Final height of free area	<b>130</b>	<b>mm</b>
Final measured free area	0.097	m <sup>2</sup>
Percentage reduction in free area	0	%

## Test item 100404A14DB

### Test requirement

Temperature designation - T600

Sootfire resistance - G

### Test conditions for heat stress test

Flue diameter was 200 mm.

Flue gas temperature was 700.3 deg. C at 60 minutes.

Effective diameter	218	mm
Circumference	684.8	mm
Initial height of free area	93	mm
Initial measured free area	0.0637	m <sup>2</sup>
Final height of free area	93	mm
Final measured free area	0.0637	m <sup>2</sup>
Percentage reduction in free area	0	%

### Test conditions for sootfire resistance test

Flue diameter was 200 mm.

Flue gas temperature 983.2 deg. C

Effective diameter	218	mm
Circumference	684.8	mm
Initial height of free area	93	mm
Initial measured free area	0.0636	m <sup>2</sup>
Final height of free area	93	mm
Final measured free area	0.0636	m <sup>2</sup>
Percentage reduction in free area	0	%

#### 4.10 CORROSION RESISTANCE

Requirement - Designation as given in clause 4.5.1 unless tested.

Item No.	Corrosion resistance class
100404A1DB	3
100404A2DB	Replaced by 100404A14DB
100404A3DB	3
100404A4DB	N/A
100404A5DB	3
100404A6DB	3
100404A7DB	3
100404A8DB	3
100404A9DB	3
100404A10DB	N/A
100404A11DB	N/A
100404A14DB	3
100404A15DB	3

#### 4.11 RAIN INGRESS

All terminals either have an overall dimension providing an angle of at least 27° from vertical of a line from the edge of the rain to the edge of the flue or are completely protected.

They are therefore considered to comply without test, see Annex A, Table A.1.

#### 4.12 FLOW RESISTANCE

A zeta value of maximum 1.5 is recommended, a free area of at least 2 times the flue area satisfies this recommendation without testing.

Item No.	Coefficient of flow resistance (zeta)
100404A1DB	1.5
100404A2DB	Replaced by 100404A14DB
100404A3DB	1.5
100404A4DB	N/A
100404A5DB	1.5
100404A6DB	1.5
100404A7DB	1.5
100404A8DB	1.5
100404A9DB	1.0
100404A10DB	N/A
100404A11DB	N/A
100404A14DB	1.5
100404A15DB	1.5



#### 4.14 PRODUCT INFORMATION

The minimum information to be included in the manufacturer's instructions are stated in BS EN 16475-2:2016 clause 7.1.

The information below should be included in the product information following issue of the final report

- Product designation
- Weight of the product
- Note that the chimney plate is to be marked to indicate that a rain cap/terminal is fitted. Note that the rain ingress test is specific to rainwater terminals, i.e. See BS EN 1856-1:2009
- The coefficient of flow

#### 4.15 DESIGNATION

Item No.	Standard	Temperature class and test temperature	Corrosion resistance	Soot fire resistance
100404A1DB	EN 16475-7	T600	3	G
100404A2DB	Replaced by 100404A14DB & 100404A15DB			
100404A3DB	EN 16475-7	T600	3	G
100404A4DB	EN 16475-7	T600	3	G
100404A5DB	EN 16475-7	T600	3	G
100404A6DB	EN 16475-7	T600	3	G
100404A7DB	EN 16475-7	T600	3	G
100404A8DB	EN 16475-7	T600	3	G
100404A9DB	EN 16475-7	T600	3	G
100404A10DB	EN 16475-7	T600	3	G
100404A11DB	EN 16475-7	T600	3	G
100404A14DB	EN 16475-7	T600	3	G
100404A15DB	EN 16475-7	T600	3	G

**Table 8 Corrosion resistance classes**

Corrosion resistance class	1 Possible fuel types	2 Possible fuel types	3 Possible fuel types
- Gas	gas: sulphur-content $\leq 50 \text{ mg/m}^3$ , natural gas L + H	gas Natural gas L + H	gas Natural gas L + H
- Liquid	kerosene: sulphur-content $\leq 50 \text{ mg/m}^3$	oil: sulphur-content $\leq 0.2 \text{ mass \%}$ kerosene: sulphur-content $\geq 50 \text{ mg/m}^3$	oil: sulphur-content $\leq 0.2 \text{ mass \%}$ kerosene: sulphur-content $\geq 50 \text{ mg/m}^3$
- Wood	-	wood in open fire places	wood in open fire places wood in closed stoves
- Coal	-	-	coal
- Peat	-	-	peat

## 4.16 MARKING AND LABELLING

### Clause 9.1 - Marking

The rain cap/terminal shall be marked with the information given in BS EN 16475-2:2016 clause 9.1, where possible.

The product designation shall be included following issue of the final report.

### Clause 9.2 - Labelling

Each package within a consignment shall be legibly marked with the information given in BS EN 16475-2:2016 clause 9.2.

The product designation shall be included on the label following issue of the final report.

## APPENDIX A: PRODUCT LABEL

**SmartStorm - Designed to Prevent Bird Entry and Rain Ingress**

Smart Storm is suitable for most conventional clay chimney pots with an approximate 8" (200mm) internal and 9½" (240mm) external diameter. StormCowl helps to prevent the entry of debris and bird nesting materials. It is very easily fitted with worm drive bands and the skirt and dome design assists in redirecting wind movement.

**Features**

- Made from corrosion proof stainless steel
- Designed to fit a standard 8" chimney pot
- Helps to prevent the entry of debris and bird nesting materials
- Very easily fitted with worm drive bands
- The skirt and dome design assists in redirecting wind movement preventing downdraughts



**Code**  
SS1  
**Finish**  
S/Steel



5 391524 311846

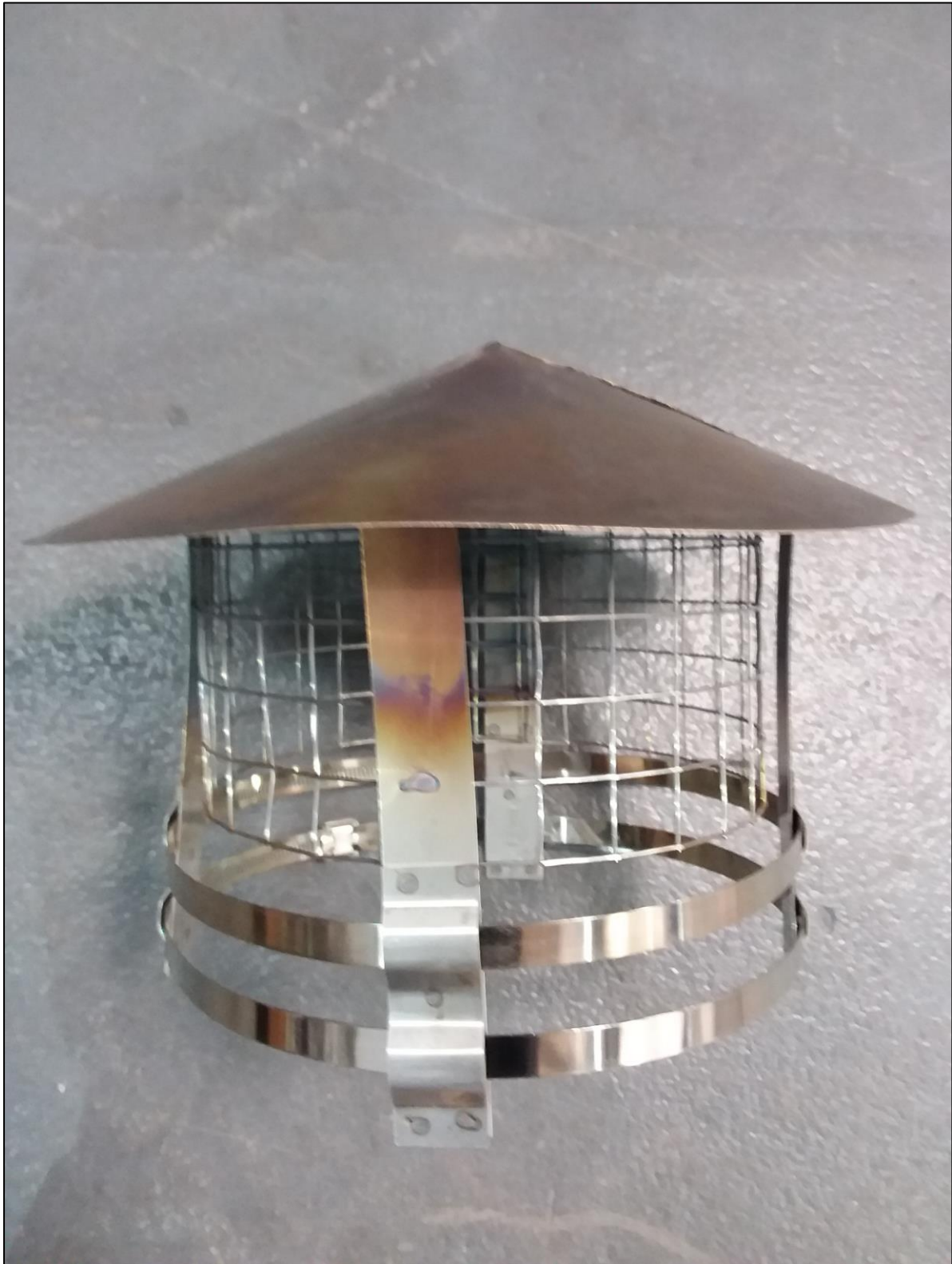
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🌐 www.iqdesign.ie



## APPENDIX B: PHOTOS OF THE PRODUCTS

**Figure 1 Smart Cap stainless steel cowl**

Test item 100404A1DB





**Figure 2 Smart Storm stainless steel cowl**

Test item 100404A2DB & 100404A14DB



**Figure 3 Smart H stainless steel cowl**

Test item 100404A3DB



**Figure 4 Smart Capping stainless steel cowl**

Test item 100404A4DB





**Figure 5 Push-Fit Smart Cap stainless steel cowl**

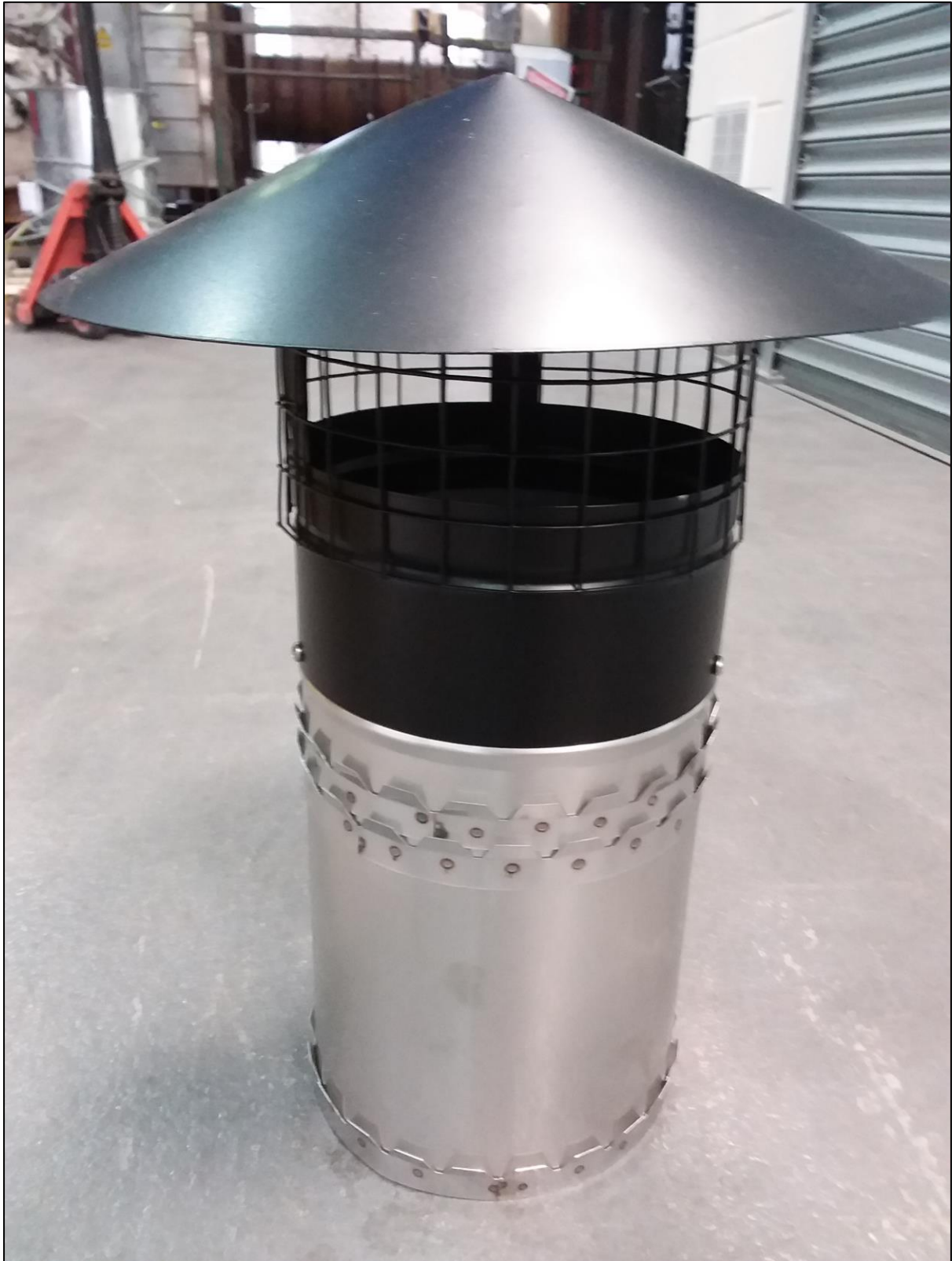
Test item 100404A5DB





**Figure 6 Push-Fit Smart Cap stainless steel cowl with black finish**

Test item 100404A6DB



**Figure 7 Push-Fit Storm stainless steel cowl**

Test item 100404A7DB



**Figure 8 Push-Fit Storm stainless steel cowl with terracotta finish**

Test item 100404A8DB





**Figure 9 Push-Fit Smart H stainless steel cowl**

Test item 100404A9DB



**Figure 10** Push-Fit Capping stainless steel cowl

Test item 100404A10DB



**Figure 11 Push-Fit Capping stainless steel cowl with black finish**

Test item 100404A11DB





**Figure 12 Smart Cap stainless steel cowl with terracotta finish**

Test item 100404A15DB

